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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,033	04/14/2004	Yoshikazu Fujimori	12844.15USD1	7384

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EXAMINER	
LEE, KYOUNG	
ART UNIT	**PAPER NUMBER**
2812	

DATE MAILED: 06/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/825,033	FUJIMORI, YOSHIKAZU	
	Examiner	Art Unit	
	Kyoung Lee	2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,6 and 9-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,6 and 9-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 10/218,988.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horie et al. (U.S. Patent No 6,517,642).

[Re claim 1] Horie discloses a method of forming a ferroelectric thin film, comprising: forming a seed layer containing an ultra-fine particle powder comprised of an element constituting the thin film to be subsequently formed on a surface of a substrate; and forming the thin film on the seed layer (see col. 7, lines 28-41), the use of a mixture of a plurality of metal powders and the formation of metal oxides (see col. 4, lines 27-52, and col. 10, lines 12-19). The examiner interpreted the first layer in the multiple cycle deposition to be the seed layer; [Re claim 2] wherein forming the seed layer includes: applying a solution containing the element constituting the thin 51111 to the surface of the substrate; and drying and baking the solution applied to the substrate (see cot. 5, lines 33-60); [Re claim 3] wherein forming the thin film includes annealing the seed layer for crystallization (see col. 6, lines 6-16); [Re claim 10] wherein the ultra-fine particle powder including a circumference that may be covered with a surface active agent and being mixed with an organic solvent (see col. 1 line 65 through col. 2 line 10); [Re claim 11] wherein the organic solvent may be α-terpineol (see col. 3 line 64 through

col. 4 line 15); and [Re claim 12] wherein the organic solvent is selected from group of xylene, toluene, 2-methoxyethanol, and butanol (see col. 3 line 64 through col. 4 line 15).

But Horie fails to disclose expressly that the thin film is of ferroelectric material in the same process and the concentration of the ultra-fine particle powder is in the range of 0.00001 wt% to about 1 wt%. However, the missing limitation is well known in the art because Horie also discloses that the method is used for forming ferroelectric material (See col. 1, lines 12-25). Horie does not disclose any concentration of powder. However any variation in concentration in the present claims is obvious in light of the cited art, because the changes in concentration produce no unexpected function.

The routine varying of parameters to produce expected changes are within the ability of one of ordinary skill in the art. Patentability over the prior art will only occur if the parameter variation produces an unexpected result. In re Aller, Lacey and Hall, 105 U.S.P.Q. 233, 235. In re Reese 129 U.S.P.Q. 402, 406. Therefore, it would have been obvious to use Horie' s teaching to obtain the invention as specified in claims 1-3 and 10-12.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (EP 940856) in view of Horie et al. (U.S. Patent No 6,517,642).

Referring to Fig. 1 and related text, Nakamura discloses a method of forming a ferroelectric memory including an FET of an MFMIS structure, said method comprising: forming a gate insulating film 24 on a semiconductor substrate 22 and between source-

drain regions S, D; forming a floating gate 26 on the gate insulating film; forming a ferroelectric layer 28 on the floating gate; and forming a control gate 30 on the ferroelectric layer.

But Nakamura fails to disclose expressly, wherein forming the ferroelectric layer comprises: forming a seed layer on a surface of the floating gate, the seed layer containing an ultra-fine particle powder comprised of an element constituting a ferroelectric thin film to be subsequently formed on the seed layer; forming the ferroelectric thin film on the seed layer, and the concentration of the ultra-fine particle powder is in the range of 0.00001 wt% to about 1 wt%.

However, the missing limitations are well known in the art because Horie discloses these features, as shown above. A person of ordinary skill is motivated to modify Nakamura with Horie to obtain ferroelectric material of uniform composition. Therefore, it would have been obvious to combine Nakamura with Horie to obtain the invention as specified in claim 6.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (U.S. Patent No. 6,020,233) in view of Horie.

Kim discloses a method of forming a ferroelectric memory comprising: forming an FET including a gate electrode 203 formed on a surface of a semiconductor substrate 201 between source-drain regions, the source-drain regions formed on the surface of the semiconductor substrate through a gate insulating film; and forming a ferroelectric capacitor .210-260 connected with one of the source-drain regions of the FET through a storage node contact 206, wherein forming the ferroelectric capacitor comprises:

forming a first electrode 230 and forming the ferroelectric thin film 250 on the first electrode.

But Kim fails to disclose expressly forming a seed layer on a surface of the first electrode the seed laver containing an ultra-fine particle powder comprised of an element constituting a ferroelectric thin film to be subsequently formed on the seed layer; forming the ferroelectric thin film on the seed layer, and the concentration of the ultra-fine particle powder is in the range of 0.00001 wt% to about 1 wt %.

However, the missing limitations are well known in the art because Horie discloses these features, as shown above. A person of ordinary skill is motivated to modify Kim with Horie to obtain ferroelectric material of uniform composition. Therefore, it would have been obvious to combine Kim with Horie to obtain the invention as specified in claim 9.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kyoung Lee whose telephone number is (571) 272-1982. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael S. Lebentritt can be reached on (571) 272-1873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KL 6/23/06

MICHAEL LEBENTRITT
SUPERVISORY PATENT EXAMINER